

Some Dermanyssid Mites (Acari), mostly from Australasian Rodents

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DOMROW, R. Some dermanyssid mites (Acari), mostly from Australasian rodents. *Proc. Linn. Soc. N.S.W.*, 103 (4), (1978), 1979: 189-208.

Results are presented from three sponsored expeditions to collect parasitic mites from mammals, mostly rodents, in remote parts of Australasia. Three new species of *Laelaps* are described from native-mice (*Pseudomys* spp.) in Western Australia: *L. janalis* from *P. occidentalis*, *L. bycalia* from *P. albocinereus*, and *L. lybacia* from *P. praeconis*. Additional data, including new hosts and localities, and previously unknown males and immature stages, are given for a further 22 species in nine genera: *Mesolaelaps* (3), *Haemolaelaps* (2), *Peramelaelaps* (1), *Laelaps* (9), *Eulaelaps* (1), *Echinonyssus* (1), *Trichosurolaelaps* (2), *Ornithonyssus* (2) and *Halarachne* (1). A small group of intractable specimens of *Laelaps* with both setae on coxa I simple is still under study.

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This paper assembles results from three Australian Biological Resources Study grants, gratefully acknowledged — one to Dr C. H. S. Watts, Institute for Medical and Veterinary Research, Adelaide, for a circum-Australian sampling of rats (Robinson *et al.*, 1978) and two to me to collect ectoparasites in remote areas of Queensland. For brevity, collectors are omitted from Dr Watts' offering (with map coordinates), but I hasten to add that they were A. C. & J. F. Robinson. Their material will be deposited in the Australian National Insect Collection, CSIRO, Canberra. The data for my contributions are: Bamaga, near Cape York, iii.1975, R. Domrow and J. S. Welch; and Kowanyama (formerly Mitchell River Mission), east coast of Gulf of Carpentaria, vi.1976, R. Domrow. These two collections will be divided between the Queensland Museum, Brisbane, and my institute (QIMR). Lastly, a few recent accessions in QIMR are added, with data in full. I thank all concerned.

Terminology is largely after Evans and Till (1965), with tarsi II-IV after Evans (1969). Hosts are after Ride (1970), with subspecies for rats supplied after Taylor and Horner (1973).

Mesolaelaps australiensis (Hirst)

Laelaps (*Mesolaelaps*) *australiensis* Hirst, 1926, *Proc. zool. Soc. Lond.*, 1926: 840.

Material. Three ♀♀, *Rattus fuscipes fuscipes* (Waterhouse) (three rats), 22 km NE Jurien (30°8', 115°8'), W.A., 12-13.iv.1975; 10 ♀♀, *R. f. coracioides* Thomas (three rats), 41 km SE Cairns (17°15', 145°56'), Qd, 16.xi.1974; seven ♀♀, *R. leucopus leucopus* (Gray), Bamaga; one ♀, *R. lutreolus lutreolus* (Gray), 20 km SW Port Macquarie (31°37', 152°50'), N.S.W., 2.ii.1975; 14 ♀♀, *R. sordidus sordidus* (Gould) (three rats), Iron Range, 23 km S Portland Roads (12°47', 143°18'), Qd, 2-3.xi.1974; two ♀♀, *R. s. sordidus* (two rats), 37 km S Cooktown (15°48', 145°14'), Qd, 9.xi.1974; 10 ♀♀, *R. s. sordidus* (four rats), 16 km S Cairns (17°4', 145°47'), Qd, 14.xi.1974; eleven ♀♀, one deutonymph (hereafter abbreviated as dn), *R. s. sordidus* (four rats), 11 km NE Atherton (17°12', 145°33'), Qd, 22.xi.1974; one ♀,

R. s. villosissimus (Waite), 2 km NE Mount Isa (20°38', 139°30'), Qd, 19.x.1974; one ♀, *R. s. villosissimus*, 32 km W Windorah (25°20', 142°18'), Qd, 15.x.1974; one ♀, *R. tunneyi tunneyi* (Thomas), 14 km S Nourlangie Camp (12°54', 132°39'), N.T., 18.vi.1975; one ♀, *R. t. culmorum* (Thomas and Dollman), 58 km N Maryborough (25°6', 152°33'), Qd, 14.i.1975; one ♀, *Hydromys chrysogaster* Geoffroy, Maslin Creek, Atherton (17°15', 145°29'), Qd, 24.xi.1974; one ♀, *Melomys littoralis* (Lönnerberg), 11 km NE Atherton (17°12', 145°33'), Qd, 22.xi.1974; one ♀, *M. littoralis*, 9 km SE Dunwich, Stradbroke Island (27°32', 153°30'), Qd, 19.i.1975.

Deutonymph. Capitulum 355 µm long, as in *M. antipodiansus* (Hirst) (see Domrow, 1977), but setae *c* and *h*₃ well exceeding sides of basis. Epistome an equilateral triangle, free sides ever so slightly convex, with weak denticulations and broad, but fine, submarginal dendritic pattern. Chelicerae stronger, 248 µm long, with digits more elongate, occupying one-quarter of total length.*

Idiosoma 780 µm long, 530 µm wide (somewhat engorged). Dorsal shield 715x335 µm, holotrichous, differing from that of *M. antipodiansus* only in that setae are slightly more elongate. Most of *Z* and *S* setae broken, but *Z*₃ certainly elongate. Setae on cuticle longer and more widely spaced than in *M. antipodiansus* (as is case in adults of two species).

Venter as in *M. antipodiansus*, but genital portion of sternogenital shield tapering very sharply behind metasternal setae, parallel-sided, only half as wide as space between genital setae; setae on cuticle again longer and more widely spaced. Postanal seta broken off, but its insertion well exceeded by adanals. At least one small metapodal shield on each side.

Legs holotrichous except for one additional *v* seta on tibia I (2-6/4-2) as in *M. antipodiansus* (♀ also showing this additional seta). Longest seta on dorsum of tarsus IV 140 µm.

Notes. *M. australiensis* is widespread in Australia, showing a low level of host-specificity (Domrow, 1961, 1962a, 1967). At a subspecific level, *R. f. fuscipes*, *R. l. leucopus*, *R. s. villosissimus*, *R. t. tunneyi* and *R. t. culmorum* are new host-records, *R. t. tunneyi* extending the range of this mite into the Northern Territory. Extra-Australian records (New Guinea, New Zealand and Kermadec Islands) were summarized by Tenorio and Radovsky (1974).

Mesolaelaps bandicoota (Womersley)

Hypoaspis bandicoota Womersley, 1956, *Linn. Soc. J., Zool.*, 42: 573.

Material. Two ♀♀, *Rattus fuscipes assimilis* (Gould), Mount Stanley, 38 km E Kingaroy (26°30', 152°13'), Qd, 16.i.1975; four ♀♀, *R. f. assimilis* (two rats), 56 km SE Canberra (35°41', 149°32'), N.S.W., 14.ii.1975; one ♀, *R. f. assimilis*, 20 km NE Mallacoota (37°27', 149°57'), N.S.W., 17.ii.1975; two ♀♀, *R. lutreolus lutreolus*, 6 km SW Bemm River (37°47', 148°54'), Vic., 21.ii.1975.

Notes. This material confirms earlier records (Domrow, 1963, 1973). All specimens show the anterior seta on coxae II-III normal (unexpanded) and the dorsal shield holotrichous, except one female from near Canberra with three setae at *J*₄ (Domrow, 1977).

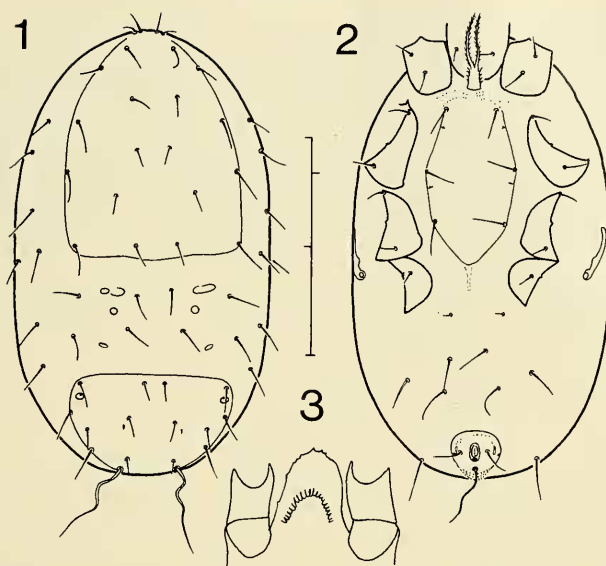
Mesolaelaps anomalus (Hirst)

Laelaps (Mesolaelaps) anomalus Hirst, 1926, *Proc. zool. Soc. Lond.*, 1926: 840.

Material. Two ♀♀, *Isodon macrourus* (Gould), Bamaga.

Notes. This material confirms previous records (Domrow, 1962a, 1967).

*Proportions, rather than absolute measurements, seem important with single deutonymphal specimens, since prefemales differ from premales only in their larger size.



Figs 1-3. *Haemolaelaps domrowi*. 1-2. Idiosoma in dorsal and ventral views, pn. 3. Epistome, ♀. Note: the subdivisions on scales with Figs 1-23 represent 100 μm .

Haemolaelaps domrowi Womersley

(Figs 1-3)

Haemolaelaps domrowi Womersley, 1958, *Proc. Linn. Soc. N.S.W.*, 82: 301.

Material. Six ♀♀, one ♂, two protonymphs (hereafter abbreviated pn), *Isodon macrourus*, Bamaga.

Female. Epistome slightly shorter and more rounded than in *H. flagellatus* Womersley (see Domrow, 1977), with fewer, slightly stronger denticles and submarginal dendritic pattern as in *H. calypso* Domrow, 1966.

Protonymph. Basis capituli slightly longer than wide, with setae *c* slightly more than half as long as interspace, exceeding sides of basis; deutosternum with at least five rows of denticles, mostly double. Hypostome with setae $h_3 > h_1 > h_2$; h_1 almost one and a half times as long as interspace; h_3 slightly more than one and a half times as long as interspace, slightly exceeding sides of basis. Labial cornicles pale, but with opposed tips. Epistome anticipating that of ♀. Palpal setation (trochanter-tibia) holotrichous, i.e. 1.4.5.12 (including two dorsodistal rods); seta al_1 on genu spatulate; tarsus with one of three *v* elongate; claw bifid. Chelicerae as in ♀, i.e. fixed digit straight, weak, edentate, with elongate pilus dentilis (small dorsal seta present, but pores not detected); movable digit stronger, with two small teeth near incurved tip.

Idiosoma 410-455 μm long, 260-300 μm wide. Surface of dorsal shields marked by paired muscle insertions and reticulate. Podonotal shield with three extremely shallow lobes posteriorly; podonotum holotrichous, with 16 pairs of setae (eleven on shield, five on cuticle). Pygidial shield semicircular, with pair of very distinct pores in anterolateral angles in front of setae S_4 . Opisthonotum holotrichous, with 14 pairs of setae (eight on shield, six on cuticle). All setae subequal except for slightly smaller j_2 and J_5 , and much longer Z_5 (lattermost sinuous, but this may be artifact of mounting).

Tritosternal base with a few distinct barbs laterally as in adult; laciniae ciliated. Sternal shield elongate, with some sign of reticulation; anterior margin weak, preceded by narrow zone of striae; lateral margins straight between insertions of setae; posterior margin triangular, with indication of short backward extension; with usual three pairs of setae and two pairs of pores. Genital complex represented only by pair of small setae. Anal shield appearing slightly foreshortened posteriorly, with postanal seta twice as long as adanals. Ventral cuticle with three pairs of setae in front of, and one pair flanking, anal shield. Peritremes short, not reaching forward beyond articulations on coxae III; peritrematal shields, if present, completely lateral and out of sight.

Legs largely folded under, but setation seen to be holotrichous. No *d* seta on femora-genua I-II unduly lengthened.

Notes. Immatures of this species were previously undescribed. The material confirms earlier records (Domrow, 1962a, 1967).

Haemolaelaps penelope Domrow

Haemolaelaps penelope Domrow, 1964, *Proc. Linn. Soc. N.S.W.*, 89: 156.

Material. One ♀, *Trichosurus caninus* (Ogilby), Clouds Creek, N.S.W., ix.1977, J. H. Arundel.

Notes. The only previous record of this species was from S.E. Queensland.

Peramelaelaps bandicoota Womersley

(Figs 4-7)

Peramelaelaps bandicoota Womersley, 1956, *Linn. Soc. J., Zool.*, 42: 574.

Material. Eleven ♀♀, five ♂♂, two dn, one pn, *Isoodon macrourus*, Bamaga.

Female. Basis capituli longer than wide, with setae *c* of moderate length, about two-fifths as long as interspace, just reaching sides of basis; deutosternum with six rows of one to three denticles. Hypostome with setae $h_3 > h_1 > h_2$; h_1 slightly longer than interspace; h_3 one and a quarter times longer than interspace, well exceeding sides of basis. Labial cornicles pale, but with opposed tips. Labrum slowly tapering, pointed, spiculate. Epistome soft and diaphanous, with smooth margin and submarginal trace of dendritic pattern reaching to midlength, about twice as long as basal width and roundly pointed, reaching just beyond distal margins of palpal femora. Palpal setation (trochanter-tibia) holotrichous, i.e. 2.5.6.14 (including two dorsodistal rods); seta *al*₁ on genu spatulate; tarsus with one of three *v* elongate; claw bifid. Chelicerae with fixed digit pale, straight, edentate (dorsal seta and pores not detected); movable digit well sclerotized, with two teeth more distinct than originally figured.

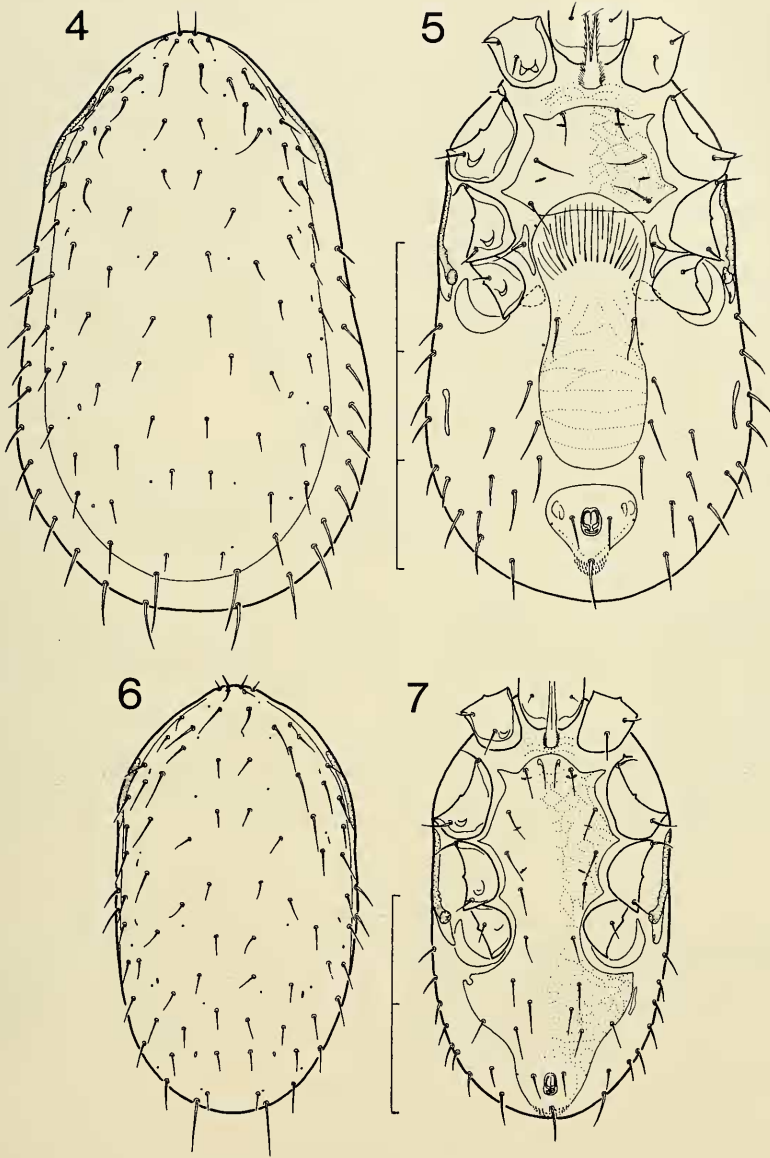
Dorsal shield with surface weakly marked by paired muscle insertions, not reticulate except for vertical, humeral and lateral band that narrows and disappears posteriorly; pores probably more numerous than figured; setation holotrichous (22 pairs of podonotal setae, 17 pairs of opisthonotals — *S*₂ lacking on one side of specimen figured).

Tritosternal base with fine, soft fringe laterally, *cf. H. domrowi* above.

Leg setation holotrichous. No *d* seta on femora-genua I-II unduly lengthened.

Male. Capitulum as in ♀ except for shorter setae h_3 (about half as long as interspace, falling short of sides of basis) and spermatodactyl. Latter with spermatophore-carrier stout, abruptly and shortly bent apically around tip of somewhat reduced movable digit.

Idiosoma 380-395 μm long, 210-240 μm wide. Dorsum as in ♀, but almost completely covered by dorsal shield and with only about two pairs of setae on cuticle.



Figs 4-7. *Peramelaelaps bandicoota*. 4-5. Idiosoma in dorsal and ventral views, ♀. 6-7. Idiosoma in dorsal and ventral views, ♂.

Sternal portion of holoventral shield as in ♀, but more arched anteriorly to accept genital aperture; ventral portion expanded and normally sharply angulate behind coxae IV, with four (at times five) pairs of usurped ventral setae. Ventral cuticle with about eight pairs of setae of increasing length posteriorly. Metapodal shields at times insensibly fused into holoventral shield. Peritremes a little shorter than in ♀.

Legs as in ♀, but spurs on coxae simpler and some ventral setae on II strengthened: *av* on femur, *av* and *pv* on genu (to some extent) and tibia, *av*₂₋₃ and *pv*₂ on tarsus.

Deutonymph. Capitulum not clear in either specimen, but essentially predicting that of ♀.

Idiosoma 475 µm long, 265 µm wide (enclosing developing ♀); 405 µm long, 235 µm wide (enclosing developing ♂). Dorsal shield with lateral incisions narrow, reaching slightly past midpoint between setae *J*₁ and *Z*₁; setation of prefemale obscured by that of developing adult, but shield of premale torn free of developing adult and clearly holotrichous (22 pairs of podonotal setae, 17 pairs of opisthonotals).

Sternogenital shield with four pairs of setae and three pairs of pores; ligulate posteriorly, leaving genital setae and pores free in cuticle. Remainder of venter not clear due to doubling, but peritremes elongate.

Leg setation not clear due to doubling, but probably holotrichous. Spurs on coxae simple.

Protonymph. Capitulum predicting that of ♀; palpal setation not clear because of doubling, but probably holotrichous.

Idiosoma 385 µm long, 210 µm wide (enclosing developing deutonymph). Podonotal shield lightly trilobed posteriorly, median lobe strongest. Pygidial shield almost straight anteriorly, but with slight median prominence; with pair of very distinct pores in front of setae *S*₄ as in *H. domrowi* above. Setation not clear because of doubling, but probably holotrichous.

Sternal shield with three pairs of setae and two pairs of pores, but outline not clear. Genital complex represented at least by a pair of small setae. Ventral cuticle with three pairs of setae in front of, and one pair flanking, anal shield. Peritremes abbreviated.

Leg setation not clear because of doubling, but probably holotrichous.

Notes. The above description of the female of this species is only so full as to complete Womersley's text; the male and immatures were previously undescribed. These specimens confirm earlier records (Domrow, 1962a, 1967).

Laelaps southcotti Domrow

Laelaps southcotti Domrow, 1958, *Proc. Linn. Soc. N.S.W.*, 82: 364.

Material. Six ♀♀, two pn, *Uromys caudimaculatus* (Krefft) (two rats), Iron Range, 19 km SW Portland Roads (12°43', 143°17'), Qd, 2.xi.1974; four ♀♀, *U. caudimaculatus* (two rats), 40 km SE Cairns (17°15', 145°56'), Qd, 15-16.xi.1974; three pn, *U. caudimaculatus*, 19 km SE Atherton (17°25', 145°31'), Qd, 25.xi.1974.

Notes. This material confirms the original record.

Laelaps sp.

Material. Many specimens, *Rattus leucopus leucopus*, Bamaga; ten ♀♀, four dn, three pn, *R. l. leucopus* (three rats), Iron Range, 19 km SW Portland Roads (12°43', 143°17'), Qd, 3.xi.1974; one ♀, one dn, *R. l. leucopus* (two rats), Iron Range, 20 km SW Portland Roads (12°44', 143°16'), Qd, 31.x.1974; one dn, one pn, *R. l. leucopus*, Iron Range, 27 km S Portland Roads (12°49', 143°18'), Qd, 2.xi.1974; three ♀♀, one ♂, three dn, *R. sordidus sordidus* (two rats), Iron Range, 23 km S Portland Roads (12°47', 143°18'), Qd, 2.xi.1974; two ♀♀, *R. tunneyi culmorum*, 58 km N Rockhampton (22°52', 150°41'), Qd, 5.i.1975.

Notes. These difficult specimens, with both setae on coxa I simple, will be treated later.

Laelaps nuttalli Hirst

Laelaps nuttalli Hirst, 1915, *Bull. entomol. Res.*, 6: 183.

Material. Two ♀♀, *Rattus rattus* (Linnaeus), Mamara, Guadalcanal, Solomon Islands, 12.xi.1975, J. A. R. Miles; one ♀, *R. rattus*, Mendana, Ndende, Santa Cruz Group, Solomon Islands, 31.x.1975, J.A.R.M.; two ♀♀, one dn, *R. rattus*, 11 km NE Atherton (17°12', 145°33'), Qd, 22.xi.1974; one ♂, *R. exulans* (Peale), Honiara, Guadalcanal, 28.x.1975, J.A.R.M.; three ♀♀, *R. exulans*, Pamua, Makira (= San Cristobal), Solomon Islands, 8.xi.1975, J.A.R.M.; four ♀♀, one ♂, *R. exulans*, Kira Kira West, Makira, 9.xi.1975, J.A.R.M.; one ♀, *R. exulans*, Mendana, 31.x.1975, J.A.R.M.; one ♀, *R. exulans*, Graciosa Bay, Ndende, 1.xi.1975, J.A.R.M.; nine ♀♀, two ♂♂, *R. exulans*, Onetar, Gaua, Banks Islands, New Hebrides, 23.x.1975, J.A.R.M.; five ♀♀, *R. lutreolus lutreolus* (two rats), 20 km SW Port Macquarie (31°37', 152°50'), N.S.W., 1.ii.1975; one ♀, *R. sordidus sordidus*, Kowanyama; six ♀♀, *R. s. sordidus* (three rats), Iron Range, 23 km S Portland Roads (12°47', 143°18'), Qd, 2.xi.1974; three ♀♀, two ♂♂, four dn, one pn, *R. s. sordidus* (three rats), 16 km S Cairns (17°4', 145°47'), Qd, 14.xi.1974; three ♀♀, one ♂, one dn, *R. s. sordidus* (three rats), 11 km NE Atherton (17°12', 145°33'), Qd, 22.xi.1974; three ♀♀, *R. s. villosissimus*, 56 km SE Boulia (15°22', 140°), Qd, 18.x.1974; five ♀♀, one ♂, *R. s. villosissimus*, 77 km SE Boulia (15°35', 140°8'), Qd, 17.x.1974; two ♀♀, one ♂, *R. s. villosissimus*, 2 km NE Mount Isa (20°38', 139°30'), Qd, 19.x.1974; eight ♀♀, six ♂♂, seven dn, one pn, *R. s. villosissimus* (two rats), 33 km SE Richmond (20°49', 143°28'), Qd, 20.x.1974; 12 ♀♀, one ♂, four dn, one pn, *R. s. villosissimus* (three rats), 32 km W Windorah (25°20', 142°18'), Qd, 15.x.1974; 21 ♀♀, one dn, *R. s. colletti* (Thomas) (eight rats), South Alligator River, 175 km E Darwin (12°42', 132°32'), N.T., 7-8.vi.1975; six ♀♀, two dn, one pn, *R. s. colletti* (four rats), Leanyer Swamp, 15 km E Darwin (12°23', 130°56'), N.T., 11.vi.1975; two ♀♀, one ♂, one dn, *R. tunneyi tunneyi* (two rats), 7 km SE Nourlangie Camp (12°49', 132°42'), N.T., 13.vi.1975; one ♀, *Pseudomys gracilicaudatus* (Gould), 98 km NW Bundaberg (24°31', 151°28'), Qd, 10.i.1975; four ♀♀, one ♂, *Melomys cervinipes* (Gould) (two rats), 32 km S Cooktown (15°45', 145°18'), Qd, 7.xi.1974; one ♀, *M. cervinipes*, 40 km SE Cairns (17°15', 145°56'), Qd, 15.xi.1974; one ♀, *M. littoralis*, 22 km S Cooktown (15°39', 145°13'), Qd, 7.xi.1974; one ♀, *M. littoralis*, Leanyer Swamp, 15 km NE Darwin (12°22', 130°56'), N.T., 11.vi.1975.

Notes. All previous Australian records of this cosmopolitan parasite of small rodents were from Queensland (e.g. Domrow, 1958, 1962a). Its range is now extended to the Northern Territory and New South Wales. At a subspecific level, *R. l. lutreolus*, *R. s. colletti* and *R. t. tunneyi* are new host-records. Two recent references of a wider (Pacific) interest are Mitchell (1964) and Marshall (1976).

Laelaps assimilis Womersley

Laelaps assimilis Womersley, 1956, *Linn. Soc. J., Zool.*, 42: 557.

Material. One ♂, *Rattus rattus*, 50 km NE Newcastle (32°39', 152°9'), N.S.W., 4.ii.1975; five ♀♀, two ♂♂, *R. fuscipes assimilis* (three rats), Mount Stanley, 38 km E Kingaroy (26°30', 152°13'), Qd, 16.i.1975; three ♀♀, two ♂♂, one dn, three pn, one larva (hereafter abbreviated l), *R. f. assimilis* (three rats), 20 km NE Mallacoota (37°27', 149°57'), N.S.W., 16-17.ii.1975; two ♀♀, *R. f. assimilis*, 5 km SW Bemm River (37°47', 148°55'), Vic., 19.ii.1975.

Notes. This material confirms the original record. The specimen from *R. rattus* is a straggler.

Laelaps wasselli Domrow

Laelaps wasselli Domrow, 1958, *Proc. Linn. Soc. N.S.W.*, 82: 363.

Material. Three ♀♀, *Hydromys chrysogaster*, Kowanyama; three ♀♀, *H. chrysogaster*, Iron Range, 26 km SW Portland Roads (12°49', 143°18'), Qd, 1.xi.1974; one pn, *H. chrysogaster*, 29 km SE Innisfail (17°46', 146°7'), Qd, 4.xii.1974.

Notes. This material confirms the original record.

Laelaps echidninus Berlese

Laelaps (Iphis) echidninus Berlese, 1887, *Acari, Myriapoda et Scorpiones hucusque in Italia reperta*. Patavii. Fasc. 39, No. 1.

Material. Eight ♀♀, *Rattus exulans*, Mendana, Ndende, Santa Cruz Group, Solomon Islands, 31.x.1975, J.A.R.M.; one ♀, *R. exulans*, Loh, Torres Islands, New Hebrides, 16.x.1975, J.A.R.M.; five ♀♀, one ♂, *R. fuscipes assimilis* (two rats), 56 km SE Canberra (35°41', 149°32'), N.S.W., 14.ii.1975; three ♀♀, *R. f. assimilis*, Wragge Creek, Kosciusko National Park (36°23', 148°28'), N.S.W., 11.ii.1975; two ♀♀, one dn, *R. f. assimilis* (three rats), 20 km NE Mallacoota (37°27', 149°57'), N.S.W., 17.ii.1975; one ♀, *R. f. assimilis*, 6 km SW Bemm River (37°47', 148°54'), Vic., 20.ii.1975; many specimens, *R. leucopus leucopus*, Bamaga; 29 ♀♀, *R. l. leucopus* (three rats), Iron Range, 19 km SW Portland Roads (12°43', 143°17'), Qd, 1-3.xi.1974; two ♀♀, *R. l. leucopus*, Iron Range, 26 km SW Portland Roads (12°44', 143°14'), Qd, 31.x.1974; one pn, *R. l. leucopus*, Iron Range, 20 km SW Portland Roads (12°44', 143°16'), Qd, 31.x.1974; nine ♀♀, *R. l. leucopus*, Iron Range, 24 km S Portland Roads (12°47', 145°18'), Qd, 31.x.1974; one ♀, *R. l. leucopus*, Iron Range, 27 km S Portland Roads (12°49', 143°18'), Qd, 2.xi.1974; 21 ♀♀, *R. l. cooktownensis* Tate (five rats), 32 km S Cooktown (15°45', 145°18'), Qd, 7-9.xi.1974; many ♀♀, *R. l. cooktownensis*, Mossman, Qd, vi.1970 and v.1971, R. Domrow and R. W. Campbell.

Notes. At a subspecific level, *R. l. leucopus* and *R. l. cooktownensis* are new host-records. Campbell *et al.* (1977) isolated a new paramyxovirus from *R. f. assimilis* and *R. l. cooktownensis*, and from mites of this species found on the latter host.

Laelaps aella Domrow

Laelaps aella Domrow, 1973, *Proc. Linn. Soc. N.S.W.*, 98: 65.

Material. Three ♀♀, *Pseudomys gracilicaudatus*, 98 km NW Bundaberg (24°31', 151°28'), Qd, 10.i.1975; five ♀♀, *P. nanus* (Gould), 7 km SE Nourlangie Camp (12°49', 132°42'), N.T., 13.vi.1975; one ♀, *P. nanus*, 14 km S Nourlangie Camp (12°54', 132°38'), N.T., 18.vi.1975; nine ♀♀, *P. nanus*, 346 km S Darwin (15°36', 131°7'), N.T., 1.vi.1975; one ♀, *P. nanus*, 18 km NE Kimberley Research Station (15°33', 128°6'), W.A., 28.v.1975; one ♀, *P. nanus*, 246 km E Derby (17°7', 125°43'), W.A., 21.v.1975; four ♀♀, *P. nanus* (two rats), 165 km E Derby (17°6', 125°10'), W.A., 15.v.1975.

Notes. The only previous record of this species was from the Northern Territory. The considerable extension of range both eastward and westward now noted takes in all but the western extreme (New Norcia, W.A.) of the combined ranges of the two known hosts, if indeed they are specifically distinct (Ride, 1970). Their mites are indistinguishable.

Laelaps rothschildi Hirst

Laelaps rothschildi Hirst, 1914, *Trans. zool. Soc. Lond.*, 20: 325.

Material. Seven ♀♀, *Melomys cervinipes* (four rats), 32 km S Cooktown (15°45', 145°18'), Qd, 7-9.xi.1974; 18 ♀♀, *M. cervinipes* (four rats), 40-41 km SE Cairns

(17°15', 145°56'), Qd, 15-16.xi.1974; four ♀♀, *M. cervinipes*, 19 km SE Atherton (17°25', 145°31'), Qd, 25.xi.1974; one ♀, *M. cervinipes*, 61 km N Rockhampton (22°51', 150°40'), Qd, 5.i.1975; two ♀♀, *M. cervinipes*, 98 km NW Bundaberg (24°32', 151°28'), Qd, 12.i.1975; 21 ♀♀, *M. littoralis* (six rats), Iron Range, 21-26 km S Portland Roads (12°44-48', 143°16-18'), Qd, 1-3.xi.1974; nine ♀♀, *M. littoralis* (four rats), Mount Simon, 22 km S Cooktown (15°39', 145°13'), Qd, 8.xi.1974; three ♀♀, *M. littoralis* (two rats), 37 km S Cooktown (15°48', 145°15'), Qd, 7.xi.1974; two ♀♀, *M. littoralis*, 25 km N Atherton (17°3', 145°26'), Qd, 21.xi.1974; one ♀, one pn, *M. littoralis*, 11 km NE Atherton (17°12', 145°33'), Qd, 22.xi.1974; 12 ♀♀, *M. littoralis* (five rats), 17 km S Cairns (17°5', 145°47'), Qd, 14.xi.1974; one ♀, *M. littoralis*, 29 km SE Innisfail (17°46', 146°7'), Qd, 3.xii.1974; three ♀♀, *M. littoralis* (two rats), 58 km N Rockhampton (22°52', 150°41'), Qd, 5.i.1975; three ♀♀, *M. littoralis*, 58 km N Maryborough (25°6', 152°32'), Qd, 14.i.1975; 13 ♀♀, one dn, one pn, *M. littoralis* (three rats), 9 km SE Dunwich, Stradbroke Island (27°32', 153°30'), Qd, 19-20.i.1975; three ♀♀, *M. littoralis*, Leanyer Swamp, 15 km NE Darwin (12°22', 130°56'), N.T., 11.vi.1975; two ♀♀, *Melomys* sp., Kowayama; six ♀♀, *Melomys* sp., 62 km NW Coen (13°27', 142°57'), Qd, 29.x.1974.

Notes. This species is common on *Melomys* in New Guinea and coastal N.E. Australia (Domrow, 1973), but was not previously recorded from the Northern Territory.

Laelaps pammorphus Domrow

Laelaps pammorphus Domrow, 1973, *Proc. Linn. Soc. N.S.W.*, 98: 69.

Material. Seventeen ♀♀, two ♂♂, *Zyzyomys argurus* (Thomas) (six rats), Mount Simon, 22 km S Cooktown (15°39', 145°13'), Qd, 7-9.xi.1974; eight ♀♀, two ♂♂, *Z. argurus* (five rats), Torola Pool, Fortescue River (21°18', 116°11'), W.A., 8.v.1975; 29 ♀♀, three ♂♂, *Z. argurus* (11 rats), 165 km E Derby (17°6-7', 125°10'), W.A., 15-17.v.1975; six ♀♀, *Z. woodwardi* (Thomas) (three rats), Canon Hill, 225 km E Darwin (12°23', 132°56'), N.T., 21.vi.1975.

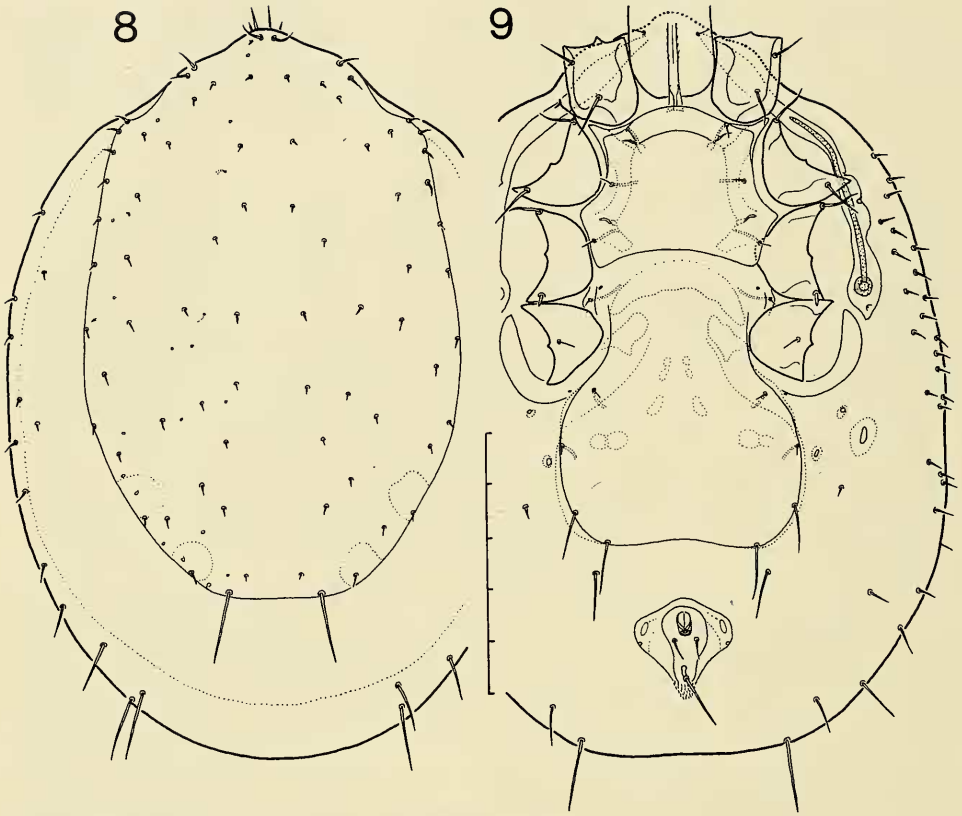
Notes. The only previous records of this species were from the Northern Territory. The considerable extension of range both eastward and westward now noted takes in all but the westernmost portion (the Pilbara, W.A.) of the combined ranges of the two known hosts (Ride, 1970). The strengthened setae J_1 and Z_1 originally noted on the dorsal shield of specimens from *Z. woodwardi* are visible at x30 in spirit when suitably lit.

Laelaps janalis, n. sp.

(Figs 8-9)

Types. Holotype ♀ and four paratype ♀♀, *Pseudomys occidentalis* Tate (two rats), 17 km NE Bendering (32°21-22', 118°28'), W.A., 1.iv.1975; one paratype ♀, same data as holotype, but 30.iii.1975.

Female. Basis capituli longer than wide, with setae c short, about one-quarter as long as interspace, falling short of sides of basis; deutosternum with six denticles mostly in single file, but first and last denticle at times multiple. Hypostome with setae $h_3 > h_1 > h_2$; h_1 about one-fifth longer than interspace; h_2 short, = c ; h_3 almost twice as long as interspace, well exceeding sides of basis. Labial cornicles well formed. Labrum spiculate, hastate. Epistome soft and diaphanous, apparently with two small lobes in median indentation. Palpal setation (trochanter-tibia) holotrichous, i.e. 2.5.6.14 (including two dorsodistal tibial rods); seta v_2 on trochanter elongate, slightly flared; seta al_1 on genu slightly spatulate; tarsus with one of three v elongate; claw bifid, tines with extended, hyaline, minutely barbed edges. Chelicerae with basal segment subequal in diameter to, but only half as long as, shaft of distal segment; digits occupying one-fifth of total length. Fixed digit with incurved tip and one distal tooth,



Figs 8-9. *Laelaps janalis*. Idiosoma in dorsal and ventral views, ♀.

between which is set short, stiff pilus dentilis about as long as diameter of digit at that level; with subbasal seta dorsally, but associated pores not detected. Movable digit with incurved tip and two external teeth, between which is accepted armature of fixed digit. Corona comprised of about ten subequal ciliations.

Idiosoma 1,230-1,375 μm long, 900-1,045 μm wide (not gravid); 1,440 μm long, 1,080 μm wide (carrying fully developed larva). Dorsal shield well sclerotized, surface marked by paired muscle insertions and with obvious reticulation; with usual sinuous vertical and humeral margins, with sides then very slightly diverging to two-thirds length, and finally converging rather more sharply to truncate posterior margin; podonotum with normal 22 pairs of setae, mostly short (j_{1-6} , z_{1-6} , s_{1-6} , r_{2-5}); opisthonotum with normal 17 pairs of setae, all short except Z_5 (J_{1-5} , Z_{1-5} , S_{1-5} , px_{2-3}); pores in 22 pairs, those in front of S_{4-5} overlain by extensive patch of transparent cuticle. Dorsal cuticle sclerotized except for narrow marginal strip, with about 12 pairs of setae of increasing length posteriorly.

Tritosternal base unarmed; laciniae lightly ciliated, reaching forward to insertions of labial cornicles. Sternal shield strongly sclerotized, especially a broad band on anterior and lateral margins, and with heavy cornua between coxae I-II; surface without any obvious reticulation except laterally; anterior margin roundly convex; posterior margin shallowly concave, without any median extension; shield with three pairs of short, slender setae and two pairs of pores (each provided with

canaliculus). Metasternal shields small, each bearing small seta (provided with canaliculus), but pore free in adjacent cuticle. Genitoventral shield strongly sclerotized, with cuticle encroaching on lateral margins; surface marked by paired muscle insertions, but without obvious reticulation; shield expanded behind coxae IV, with sides subparallel and posterior margin shallowly concave; with pair of short genital setae and three pairs of usurped ventral setae (first pair short, other two pairs long), but pores free in adjacent cuticle; operculum broadly arched, sclerotized internally and supported by strong genital apodemes. Anal shield well sclerotized except for elongate clear central patch bearing anus and setae; lateral angles each with muscle insertion and marginal pore; shield slightly longer than wide, with both antero- and posterolateral margins slightly concave; adanal setae set just behind anus, falling well short of long postanal seta, and latter far exceeding cribrum. Metapodal shields and two pairs of shieldlets between them and genitoventral shield all largely encroached on by cuticle. Peritremes of medium length, extending forward only to level of anterior margins of coxae II, borne on peritrematal shields that run forward to fuse with dorsal shield vertically but are free of broadly crescentic exopodal shields IV behind. Ventral cuticle with about 30 pairs of setae of increasing length posteriorly, including one long pair immediately behind genitoventral shield.

Legs with setation called for by Evans and Till (1965) for dermanyssids in general, and for *L. echidninus* in particular (i.e. holotrichous except for one additional *pl* seta on genu IV, 2.5/1.2). Coxa III with *pv* a heavy spine. Trochanters I-II with *al*, and III-IV with *al* and *d* strengthened, but still sharply pointed. Femora I-II with *pd*₁ lengthened, reaching distal margin of tibia in former, but barely as long as basal diameter of segment in latter; II with *av* slightly, and III with *v* heavily, spinose. Genu I with *pd*₃ lengthened, a little longer than *ad*₁ on femur I. Tarsi II-IV with *ad*₁ and *pd*₁ minute and other setae, especially ventrodistally, strengthened (in particular, *al*₁, *av*₁ and *pl*₁ on II and *al*₁₋₂ on III); II without *ad*₃ unduly lengthened as in *L. albycia* Domrow, 1965.

Larva. Details not clear within ♀, but podonotum holotrichous, with 10 pairs of setae ranging from 90 (*j*₁) to 290 μm (*j*₆) in length; opisthosoma also with several pairs of elongate setae.

Notes. This fine new species will not go beyond the first couplet in Domrow's (1965, 1973) keys and diagnoses. In showing a relatively full complement of setae on the dorsal shield and peritremes of at least medium length, it fits with the *nuttalli*, *spatanges* and *hapaloti* groups; but the minute genital and first pair of usurped ventral setae on the genitoventral shield indicate the *finlaysoni* group.

A review of the Australian *Laelaps* spp. awaits study of a collection from the Kimberley region of Western Australia (this includes further new species, but cannot be treated here by reason of the conditions of loan).

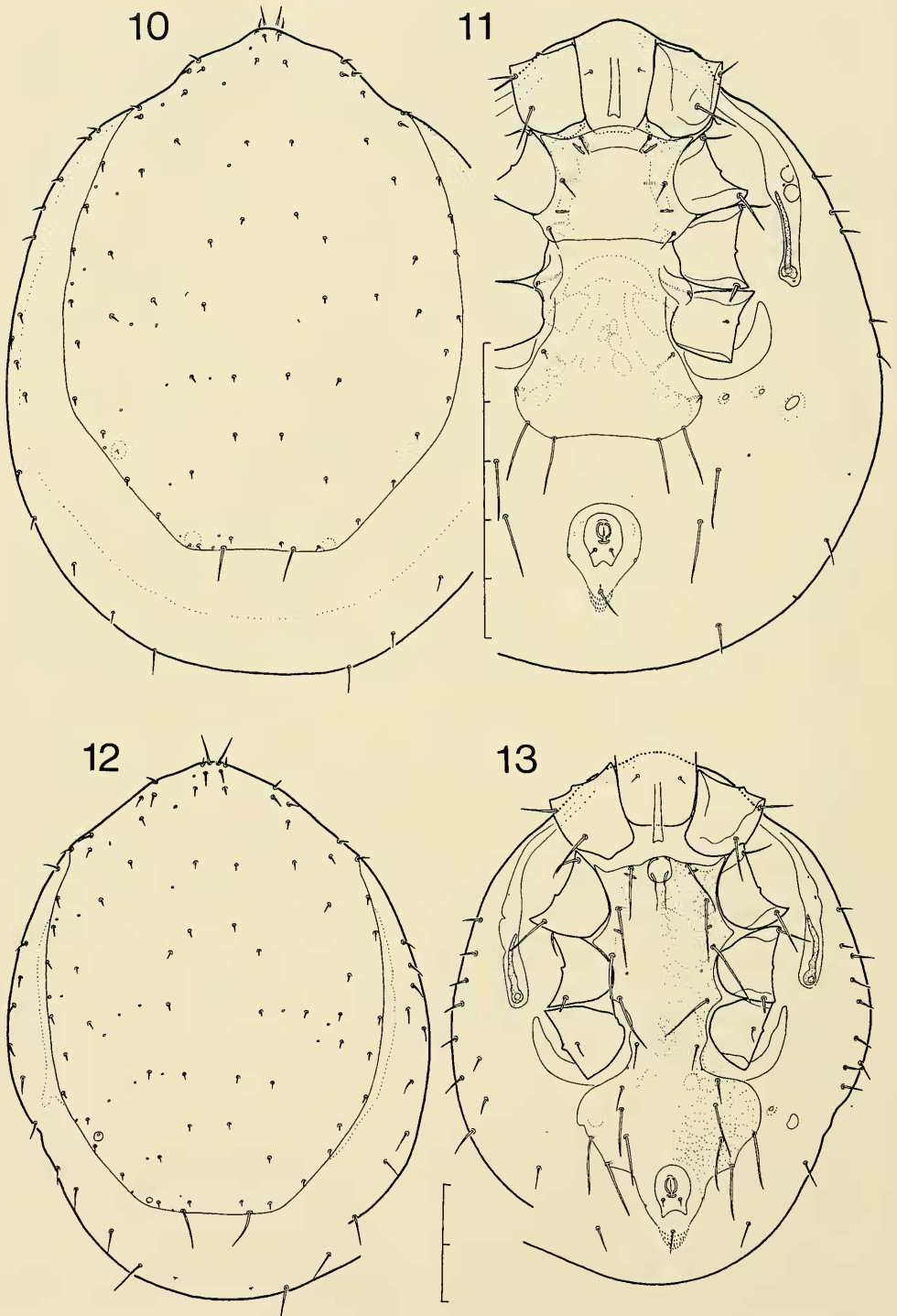
The specific name is a Latin adjective, *janal-is*, *-e*, of Janus, the Roman god of the year, who looked both to the front and back.

Laelaps bycalia, n. sp.

(Figs 10-17)

Types. Holotype ♀, allotype ♂, two paratype ♀♀, one morphotype dn and one morphotype pn, *Pseudomys albocinereus* (Gould) (two rats), 22 km NE Jurien (30°8', 115°9'), W.A., 13.iv.1975.

Female. Capitulum as in *L. albycia* except as follows. Setae *c* shorter, about one-quarter as long as interspace, falling short of sides of basis. Setae *h*₂ slightly longer; *h*₃ longer, about three-quarters as long as interspace. Epistome with four small, weak median lobes. Basal segment of chelicerae one-tenth shorter than shaft of distal segment.



Figs 10-13. Laelaps bycalia. 10-11. Idiosoma in dorsal and ventral views, ♀. 12-13. Idiosoma in dorsal and ventral views, ♂.

Idiosoma 1,100 μm long, 905 μm wide (older specimen bearing larva); 990 μm long, 825 μm wide (recently moulted, non-gravid specimen). Dorsal shield moderately well sclerotized, surface marked by paired muscle insertions but without reticulation; outline essentially as in *L. janalis*, but tapering more sharply in posterior third, more sharply truncate posteriorly and of rather broader proportions; podonotum with 20 pairs of setae, mostly short (first two, somewhat isolated pairs on dorsal cuticle could well be r_{3-4} , thereby making up normal 22 pairs); opisthonotum with 15 pairs of setae, all short except Z_5 (px_{2-3} lacking); pores as in *L. janalis*, but patches of transparent cuticle in front of S_{4-5} smaller. Dorsal cuticle sclerotized except for marginal strip (evident in recently moulted specimen only as slight granulation of cuticle), with about 12 pairs of setae of slightly increasing length posteriorly (excluding two isolated anterior pairs noted above).

Venter as in *L. janalis* except as follows. Sternal shield with posterior margin almost straight and all setae rather longer, st_3 well exceeding posterolateral angles. Genitoventral shield with outline almost straight between genital setae and first pair of usurped ventral setae, then rounding sharply to ever so slightly concave posterior margin; difference between two types of setae on shield more marked. Anal shield with clear central patch not extending to cribrum; anterior margin strongly arched; anal setae smaller, especially adanals. Peritremes abbreviated, situated entirely above coxae III. Ventral cuticle marginally with about seven pairs of setae of increasing length posteriorly and two marked pairs immediately behind genitoventral shield.

Legs with setation called for by Evans and Till (1965) for dermanyssids in general, and for *L. echidninus* in particular (i.e. holotrichous except for one additional pl seta on genu IV, 2-5/1-2). Details as in *L. janalis* except on tarsi: II-III (but not IV) with setae, especially ventrodistally, strengthened; II as in *L. albycia*, i.e. al_1 and pl_1 strengthened (but still pointed), ad_3 and (to lesser extent) av_3 lengthened, and one seta on basitarsus (ad_4) strengthened; III with al_{1-2} , av_3 and (on basitarsus) al_4 strengthened.

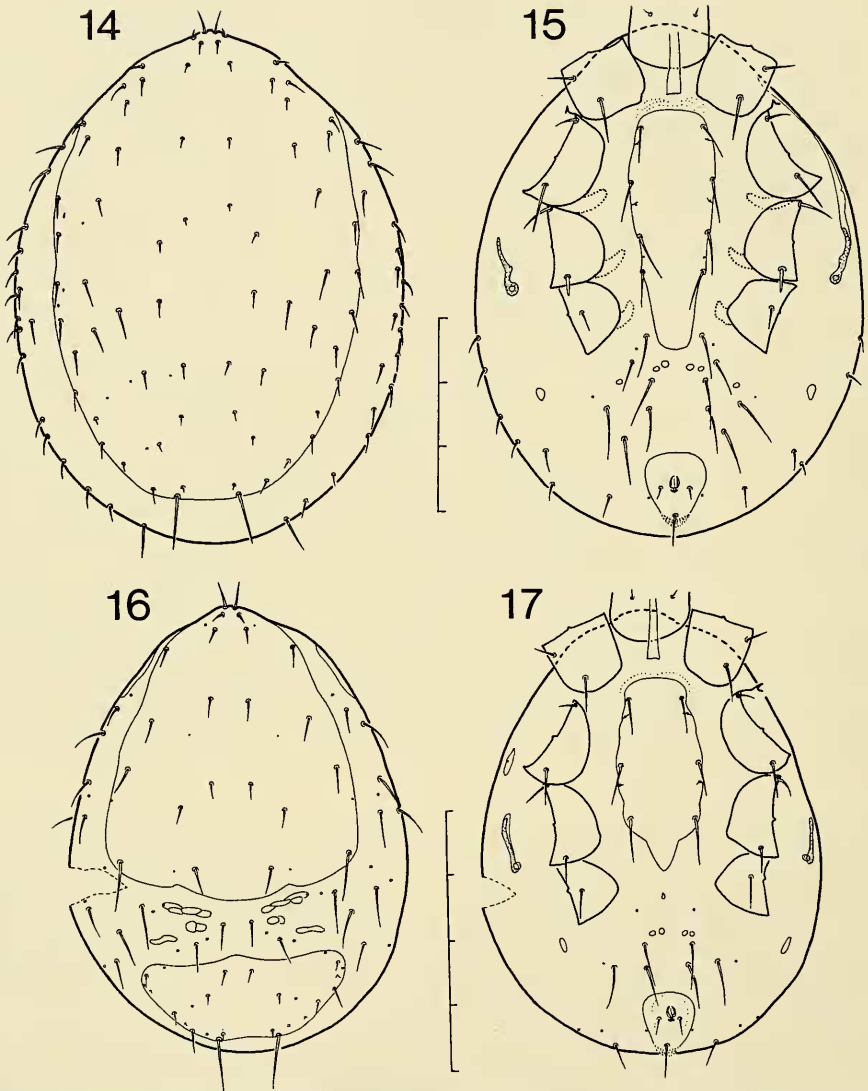
Male. Capitulum as in ♀ except as follows. Some deutosternal denticles multiple. Hypostomatal setae subequal, h_1 about two-thirds as long as interspace. Labial cornicles softer, flared at tips. Chelicerae with fixed digit soft, gently tapering and edentate, 55 μm long, 8 μm wide basally. Spermatodactyl 110 μm long, occupying five-sixteenths of total cheliceral length; lightly upcurved, with edentate, but firmly pointed, remnant of movable digit just beyond half length. Neither chelicera protruded far and corona not detected.

Idiosoma 890 μm long, 705 μm wide (slightly ruptured). Dorsum as in ♀ except as follows. Dorsal shield less angulate in posterior third; podonotum with 21 pairs of setae, i.e. taking in r_3 , but presumptive r_4 (lacking on one side) still free in cuticle; also irregular in lacking one z_6 and one S_1 , and in doubling of one Z_1 . Strip of sclerotized cuticle narrow, irregular and largely incomplete posteriorly.

Venter as in ♀ except as follows. Holoventral shield reticulate except for elongate patch extending from level of metasternal setae to disc of genitoventral portion; setae st_{1-3} and metasternal setae far longer; genitoventral portion with genital setae and five pairs of usurped ventral setae, difference between two types of setae less marked. Metapodal shields simpler.

Leg setation as in ♀ except as follows. Coxa IV with v much longer. Some other setae stronger, resembling pv on coxa III: femora I four v , II pv_1 , IV v ; genua I, III pv , II av and pv , IV pl_1 ; tibiae I, III-IV pv , II av and pv .

Deutonymph (enclosing ♂). Capitulum as in ♂ except that chelicerae resemble those of ♀.



Figs 14-17. *Laelaps bycalia*. 14-15. Idiosoma in dorsal and ventral views, dn. 16-17. Idiosoma in dorsal and ventral views, pn.

Idiosoma 790 μm long, 620 μm wide. Dorsum as in ♀, but shield less angulate in posterior third, with longer setae (r_s free in cuticle on one side), showing only traces of lateral incisions between podonotal and opisthonotal halves, and not invested by strip of sclerotized cuticle.

Venter with same setation as ♂, but sternogenital shield discrete and peritrematal shields less developed.

Leg setation anticipating that of ♂, including genu IV.

Protonymph. Capitulum holotrachous, anticipating that of ♀.

Idiosoma 670 μm long, calculated to be 550 μm wide. Podonotal shield with three shallow lobes posteriorly; podonotum holotrichous, with 16 pairs of setae (eleven on shield, five on cuticle). Pygidial shield transverse, slightly concave anteriorly but with slight median convexity; opisthonotum normally holotrichous, with 14 pairs of setae (eight on shield, six on cuticle — superficial count would give thirteen pairs, but closer examination reveals S_4 lacking on one side of shield and S_5 on other).

Sternal shield elongate, with posterior margin distinctly triangulate; with usual three pairs of setae and two pairs of pores. Genital complex represented only by pair of distinct pores. Ventral cuticle with four pairs of setae. Peritrematal shields in three fragments.

Leg setation holotrichous except for one additional *pl* seta on genu IV (1-4/0-1), predicting that of ♀ except for coxae: III with *pv* hardly strengthened, IV with *v* elongate.

Larva. Details not clear within ♀, but podonotum holotrichous, with 10 pairs of setae ranging from 18 (s_6) and 25 (j_1) to 135 μm (j_6) in length. Opisthosoma with a few pairs of setae resembling s_6 .

Notes. This new species keys out near *L. finlaysoni* Womersley, 1937, see Domrow (1963, 1965), but the outlines of both the dorsal and genitoventral shields in the female show clear differences. Further, although both species show 35 pairs of setae on the dorsal shield, there also appear to be fundamental differences in the *J* and *px* series on the opisthonotal portion; these await further study, see notes on *L. janalis* above.

The specific name of this, and the other new species below, are both anagrams of *calabyi*, and are to be treated as nouns (nominative singular) in apposition to *Laelaps*.

Laelaps cybiala Domrow

Laelaps cybiala Domrow, 1963, *Proc. Linn. Soc. N.S.W.*, 88: 206.

Material. Two ♀♀, *Mastacomys fuscus* Thomas, Wragge Creek, Kosciusko National Park (36°23', 148°28'), N.S.W., 10.ii.1975.

Notes. This material confirms the original record.

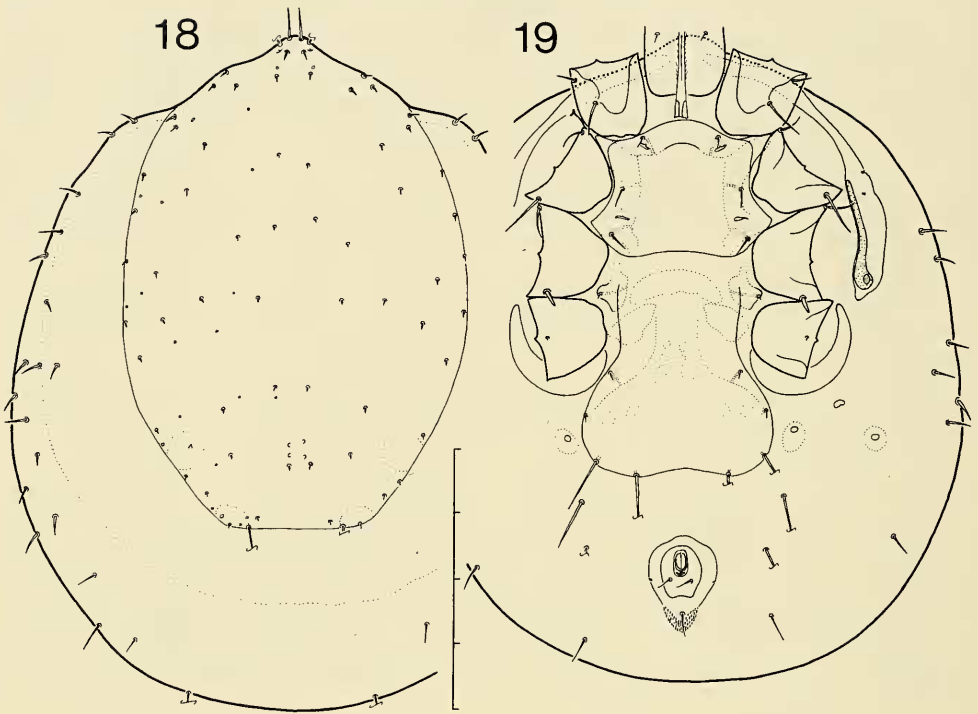
Laelaps lybacia, n. sp.

(Figs 18-19)

Types. Holotype ♀, *Pseudomys praeconis* Thomas, Bernier Island (24°55', 113°8'), W.A., 22.iv.1975.

Female. Capitulum as in *L. albycia* except as follows. Setae *c* much shorter, about one-eighth as long as interspace, falling well short of sides of basis. Setae h_1 not fully clear, but shorter than interspace; h_3 longer, about three-fifths as long as interspace. Epistome not clear. Basal segment of chelicerae one-fifth shorter than shaft of distal segment.

Idiosoma 1,035 μm long, 845 μm wide. Dorsal shield moderately well sclerotized, surface marked by paired muscle insertions but without reticulation except for two or three weak humeral lines; outline intermediate between those of *L. janalis* and *L. bycalia*; podonotum with 19 pairs of setae, mostly short (z_3 lacking, first of two, somewhat isolated pairs on dorsal cuticle could well be r_{3-4}); opisthonotum with 14 pairs of setae, all short except Z_5 (S_3 lacking, *J* and *px* series requiring further study); pores as in *L. janalis*, but patches of transparent cuticle in front of S_{4-5} slightly smaller. Dorsal cuticle sclerotized except for broad marginal strip, with about 17 pairs of setae of slightly increasing length posteriorly (excluding two isolated anterior pairs noted above).



Figs 18-19. *Laelaps lybacia*. Idiosoma in dorsal and ventral views, ♀.

Venter as in *L. bycalia* except as follows. Sternal shield with posterior margin slightly concave and setae st_1 short compared to st_{2-3} . Genitoventral shield rounded laterally and more concave posteriorly. Adanal setae stronger, postanal weaker.

Legs with setation called for by Evans and Till (1965) for dermanyssids in general, and for *L. echidninus* in particular (i.e. holotrichous except for one additional *pl* seta on genu IV, 2-5/1-2). Details as in *L. bycalia*.

Notes. This new species keys out near *L. finlaysoni*, see Domrow (1963, 1965), but differs therefrom in lacking setae z_3 and S_3 on the dorsal shield, and in its broader genitoventral shield. The *J* and *px* series on the dorsal shield show certain fundamental similarities, but await further study, see notes on *L. janalis* and *L. bycalia* above.

Eulaelaps stabularis (Koch)

Gamasus stabularis Koch, 1839, *Deutschlands Crustaceen, Myriapoden und Arachniden*. Regensburg: Herrich-Schäffer. Heft 27: No. 1.

Material. Two ♀♀, *Felis catus* Linnaeus, Hamilton, Vic., xi.1975, A.M. Freemantle.

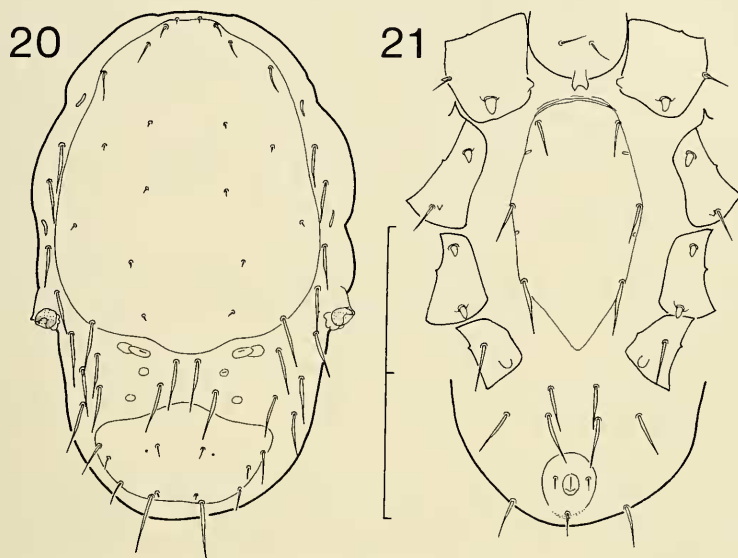
Notes. The only other record of this apparently recently introduced Holarctic and Oriental species in Australia is from *Mus musculus* Linnaeus in Tasmania (Domrow, 1973).

Echinonyssus butantanensis (da Fonseca)

Ichoronyssus butantanensis da Fonseca, 1932, *Mem. Inst. Butantan*, 7: 135.

Material. One ♀, *Rattus rattus*, 26 km NE Perth (31°13', 116°9'), W.A., 4.iv.1975.

Notes. Previous Australian records of this introduced species were all from the east: Womersley (1956, as *Hirstionyssus arcuatus* (Koch); Glenfield is near Sydney, N.S.W., not in Qd) and Domrow (1961, 1963, as *H. musculi* (Johnston)). The specific name now used is after Evans and Till (1966) and Herrin (1974).



Figs 20-21. *Trichosurolaelaps crassipes*. Idiosoma in dorsal and ventral views, pn:

Trichosurolaelaps crassipes Womersley
(Figs 20-21)

Trichosurolaelaps crassipes Womersley, 1956, *Linn. Soc. J., Zool.*, 42: 564.

Material. Six ♀♀, *Trichosurus vulpecula* (Kerr), Belbora, Kowanyama, iv.1969, R. Domrow and E. T. Bulfin; three ♀♀, two ♂♂, *T. vulpecula*, Kowanyama; three ♀, *T. vulpecula*, D'Aguilar, Qd, 1.iv.1957, R. Domrow; one ♂, *T. vulpecula*, Grovely, Qd, 24.ii.1965, E. H. Derrick; eight ♀♀, one ♂, *T. vulpecula*, Brookfield, Qd, 30.iii.1973, G. Wolf; six ♀♀, *T. vulpecula*, Woodridge, Qd, 29.x.1963, R. Domrow and I. D. Fanning; three ♀♀, *T. vulpecula*, Bonalbo, N.S.W., 2.vi.1961, K. Keith and D. L. McIntosh; two ♂♂, one dn, one pn, *T. vulpecula*, Taronga Park Zoo, Sydney, N.S.W., 18.viii.1967, M. D. Murray; five ♀♀, five ♂♂, four dn, four pn (sample only), *T. vulpecula*, Sunbury, Vic., v.1977, J. H. Arundel; one ♀, three ♂♂, *T. vulpecula*, North Midlands, Tas., 2.vii.1962, R. H. Green; one ♀, one ♂, *T. vulpecula*, Kelso, Tas., 16.ii.1961, B. C. Mollison; eight ♀♀, two ♂♂, *T. vulpecula*, Maydena, Tas., 10.v.1961, B. C. Mollison.

Deutonymph. Details of capitulum and legs as in adult, but armature of legs weaker, betraying its setal origin (e.g. in prefemale, more than in premale, seta av_2 on genu-tibia I is spinose basally, but then strongly notched and setiform distally).

Idiosoma 450-460 μm long, 285-290 μm wide (prefemale); 445-470 μm long, 295-310 μm wide (premale). Dorsal shield not incised laterally between podonotal and opisthonotal portions; setation as in ♂, but setae on margin of shield (behind level of coxae II) and those on cuticle distinctly bladed.

Sternogenital shield with four pairs of setae and three pairs of pores, gently tapering behind setae st_2 to terminate roundly between genital setae (genital pores not detected). Anal shield as in ♀. Setae of ventral cuticle bladed, in eight to ten pairs. Peritremes much abbreviated both in prefemale and in premale, barely as long as diameter of stigmata (characteristic adult form clear in one enclosed ♀).

Protonymph. Palpal trochanter-genu holotrichous.

Idiosoma 310-340 μm long, 190-220 μm wide (in front of peritremes). Podonotal shield trilobed posteriorly, median lobe the strongest; podonotum holotrichous, with 16 pairs of setae (11 on shield, five on cuticle — j_{1-3} and z_2 of differing lengths; j_{4-6} , z_{4-5} and s_4 minute; s_5 and five pairs on cuticle long and bladed). Pygidial shield semicircular, but with median convexity on anterior margin; opisthonotum bifid, with 12 pairs of setae (six on shield, six on cuticle — J_{4-5} minute, as is submarginal Z_4 between marginal S_{4-5} of medium length; Z_5 long but simple; six pairs on cuticle long and bladed).*

Sternal shield with usual three pairs of setae (of increasing length posteriorly; st_2 slightly, and st_3 clearly, bladed) and two pairs of pores. Metasternal and genital complexes not detected. Anal shield predicting that of ♀. Ventral cuticle with three pairs of bladed setae in front of, and one pair of stout setae flanking, anal shield. Stigmata strong, protuberant, without peritremes.

Leg setation holotrichous except that tibia IV is unidifferent posterolaterally (1-3/2-0). Armature already predicting that of adult.

Notes. These records document Domrow's (1972) bald statement that this species is common on this host in eastern Australia. Kowanyama is the northernmost record.

Troughton (1965: 105) noted that small [unidentified] mites caused annoyance and irritation in *Schoinobates volans* (Kerr), especially when sickly. Species of *Trichosurolaelaps* may now be linked with tissue damage in their hosts, at least in zoo conditions. The series of *T. crassipes* from Taronga Park Zoo stemmed from areas of alopecia and keratinization around the head, elbows, hocks and perineum, with evidence of intense itching; that from Sunbury from the back of a mature female possum that, having been held captive for six months, had been biting at the area for two to three weeks, the mites apparently being quite irritating. The series of *T. striatus* below from Dandenong was from a skin scraping; that from Werribee from a heavily infested possum with a large area of hair loss consistent with trauma induced by irritation.

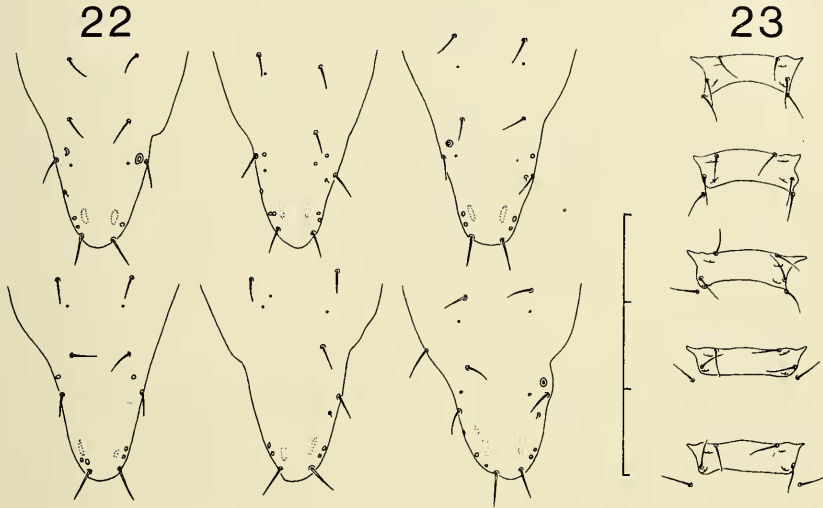
Trichosurolaelaps striatus Domrow

Trichosurolaelaps striatus Domrow, 1958, *Proc. Linn. Soc. N.S.W.*, 82: 356.

Material. Many specimens, *Pseudocheirus peregrinus* (Boddaert), Mosman, N.S.W., 26.v.1966, A. L. Dyce; two ♀♀, *P. peregrinus*, Dartmouth, Vic., 22.xi.1973, I. Beveridge; three ♀♀, one ♂, *P. peregrinus*, Dandenong, near Melbourne, Vic., vii.1977, N. J. Barton; many specimens, *P. peregrinus*, Werribee, Vic., ix.1977, J. H. Arundel.

Notes. Domrow (1961) extended the range of this species from S.E. Queensland to Tasmania, but without intermediate records. See also notes on preceding species.

*Setae J_4 and Z_4 are assigned these signatures because the former is set just inside a wideset pair of pores (*cf.* holotrichous condition in Figs 1 and 16), and the latter because its position allows only this interpretation. Domrow (1972), writing before immatures were known in this genus, but knowing that J_{3-4} and Z_{3-4} all occur in the holotrichous condition, arbitrarily considered the posteriormost seta possible to be the absent one in the case of deficiencies in the adults. When further immatures are known, the situation can again be analysed.

Ornithonyssus bacoti (Hirst)*Leiognathus bacoti* Hirst, 1913, *Bull. entomol. Res.*, 4: 122.*Material.* Two pn, *Rattus rattus*, 26 km NE Perth (31°13', 116°9'), W.A., 4.iv.1975.*Notes.* This species, the tropical rat mite and a minor pest of man, is widespread in Australia (Hirst, 1914; Domrow, 1963, 1973). Closer examination quickly showed that these two nymphs did not belong with the female of *E. butantanensis* above that was collected on the same rat.

Figs 22-23. *Ornithonyssus sylviarum*. 22. Six variants of tapered posterior portion of dorsal shield, ♀ (four pairs of longer, and one pair of shorter, setae are normal complement; 12 pairs more anteriorly). 23. Five variants of sternal shield, ♀ (second from bottom most typical).

Ornithonyssus sylviarum (Canestrini and Fanzago)

(Figs 22-23)

Dermanyssus sylviarum Canestrini and Fanzago, 1877, *Atti Ist. Veneto*, 5: 124.*Material.* Seven ♀♀, one pn, nestling *Hirundo neoxena* Gould, Campania, Tas., 9.i.1974, P. Park.*Notes.* These specimens, from a new host, underline the widespread occurrence of this pest of poultry on native birds in temperate southern Australia (Domrow, 1973). A customary key character for this species is the disassociation of setae st_3 from the sternal shield, but the condition varies considerably from specimen to specimen (as does the setation of the posterior portion of the dorsal shield); see also Allred (1970).*Halarachne miroungae* Ferris*Halarachne miroungae* Ferris, 1925, *Parasitology*, 17: 166.*Material.* Two l, *Mirounga leonina* (Linnaeus), Macquarie Island, Southern Ocean, summer of 1976, I. Morgan.*Notes.* The previous nearest record of this species to Australia probably originated from Kerguelen, some 5,000 miles to the west (Domrow, 1962b, 1974).

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